Hello again! 😊

This week we will be working on writing and solving equations using a variable. I will be including pages from the text, as well as Netmath activities. Take your time, space the lessons out, and just try your best!

To start, we need to be reminded the difference between an equation and expression.

An equation is defined as a complete math sentence. Ex: 3+6=9

An expression is defined as an incomplete math sentence. Ex: 4+2

The math games you have been offered the last two weeks encouraged solving equations that looked something like this:

 + 3 = 5

Where you solved for the missing variable. We have been doing problems like these since we were small. 😊 These math sentences are called "algebraic equations", but now, instead of using a box to represent an unknown value we will use a letter.

For example,  + 3 = 5 will become n + 3 = 5 where we will solve for the missing variable, n (the missing number).

To start, we will look at writing algebraic equations to solve. Read through the next two pages from the text that give examples of these types of exercises. The third page gives some questions to try. Keep in mind, you do not need to do all questions. (Look for circled questions).

Which statements below are equations?
How do you know?

$3 + 7 = 10$ $3 + 7 + 10$ $12 = 14 - 2$ $12 - 2 + 14$ $5 - 1 = 2 + 2$

How would you say each equation without using these words:
"plus", "add", "minus", or "take away"?

Explore

You will need index cards and scissors.

➤ Create 4 game cards, each one similar to one of the cards below.
Use one of $+$, $-$, $\times$, or $\div$ in each equation.

Eight is three more than a number.	$8 = \square + 3$
Two less than a number is nine.	$\triangledown - 2 = 9$
Four times a number is twenty.	$4 \times \Diamond = 20$
Five is thirty divided by a number.	$5 = 30 \div *$

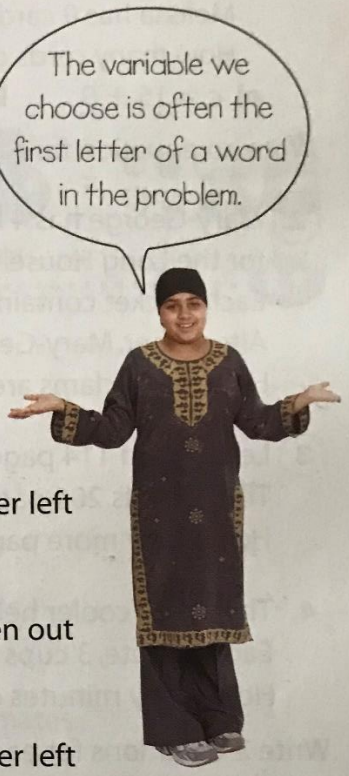
➤ Cut the cards in half, then shuffle them.
Trade your cards with those of another pair of classmates.
Match each sentence to its equation.

Show *and* Share

What strategies did you use to write the equations?
How did you decide which symbol to use?
What strategies did you use to match the cards?
For each sentence, how could you write the equation a different way?

Connect

We may be able to write an equation to help us solve a problem.
We use a letter variable to represent what we do not know.



➤ Jean-Luc opened a package of 20 pencils.
He gave out some pencils.
There were 6 pencils left.
How many pencils did Jean-Luc give out?

We use a variable to represent the number of pencils given out.
Let p represent the number of pencils given out.
Here are 3 equations we can write.

- We know that:
  Total number of pencils = number given out + number left
  One equation is: $20 = p + 6$
- We know that:
  Number left = total number of pencils − number given out
  A second equation is: $6 = 20 - p$
- We know that:
  Number given out = total number of pencils − number left
  A third equation is: $p = 20 - 6$

➤ Marie had 36 e-mails in her inbox.
This was twice as many e-mails as she had last week.
How many e-mails did Marie have last week?

Let e represent the number of e-mails Marie had last week.
Here are 2 equations we can write.

- We know that:
  2 × number of e-mails last week = number of e-mails this week
  One equation is: $2 \times e = 36$
  Or, $2e = 36$

We write $2 \times e$ as $2e$: that is, we do not write the multiply sign.

- We know that:
  Number of e-mails last week = number of e-mails this week ÷ 2
  A second equation is: $e = 36 \div 2$

Practice

1. Which equation below represents this problem? Explain your choice.
Together, Melissa and Pierre have 15 rare hockey cards.
Melissa has 9 cards.
How many cards does Pierre have?

a) $c = 15 + 9$ **b)** $15 = c + 9$ **c)** $9 = 15 + c$ **d)** $c - 15 = 9$

Write an equation for each of questions 2 to 4.

2. Mary-George has 4 buckets of clams for the Long House feast.
Each bucket contains the same number of clams.
Altogether, Mary-George has 120 clams.
How many clams are in each bucket?

3. Lesley read 114 pages of an exciting novel.
The novel is 204 pages.
How many more pages does Lesley have to read?

4. The water cooler held 66 cups of water.
Each minute, 3 cups of water were taken.
How many minutes did it take for the water cooler to empty?

Write 2 equations for each of questions 5 and 6.

5. Three towers were built. Each tower had the same number of toy blocks.
Altogether, there were 144 blocks.
How many blocks were in each tower?

6. Jaipreet picked 30 boxes of blueberries in the bush.
After she sold some boxes, she had 13 boxes left.
How many boxes did Jaipreet sell?

7. Write a word problem for which you can write an equation.
Write as many equations as you can for your problem.
Explain how you know each equation represents the problem.

Reflect

Look at the questions I

Following this, we will continue with Solving Algebraic Equations using Addition and Subtraction.

When solving equations, we have a couple of ways we can solve at our level:

a. Trial and Error (also called Guess and Test)
b. Inspection

Read through the following examples that explain each of these approaches. The questions from the text are provided again. (Remember, you don't have to do every question.)

Here are two ways to solve this equation.

- Guess and test

$98 = 72 + w$
Guess a number for w, then test to see if you are correct.

Guess: $w = 10$
Test: $72 + 10 = 82$ This is too low.

Guess: $w = 20$
Test: $72 + 20 = 92$ This is too low, but closer to the number we want.

Guess: $w = 25$
Test: $72 + 25 = 97$ This is very close.

Guess: $w = 26$
Test: $72 + 26 = 98$
So, $w = 26$

$w = 26$ is the **solution** to the equation.

- **By inspection**

$98 = 72 + w$
Which number do we add to 72 to get 98?

We subtract to find out.
The number we add is: $98 - 72 = 26$
So, $w = 26$

Wendy has 26 more windows to wash.

By *inspection* means I look at, or *inspect*, the equation to try to figure out the number that w represents.

Practice

1. Solve each equation.
Which strategy will you use?
a) $20 = c + 1$ **b)** $c + 2 = 20$ **c)** $3 + c = 20$ **d)** $20 = 4 + c$

2. Solve each equation.
Which strategy will you use?
a) $10 = n - 1$ **b)** $n - 2 = 10$ **c)** $10 - n = 3$ **d)** $4 = 10 - n$

For each of questions 3 to 7, write an equation.
Solve the equation to solve the problem.

3. Scott and Jamie have a collection of autographed pictures.
Altogether, they have 36 pictures.
Scott has 13 pictures.
How many pictures does Jamie have?

4. The girls' field hockey team has 32 jerseys.
Some of these jerseys are new. Nineteen jerseys are from last year.
How many jerseys are new?

5. Mandeep buys a case of 24 cans of juice.
In one week, Mandeep drinks 11 cans.
How many cans are left?

6. Sholeh wants to add 40 files to a folder in her laptop computer.
There is only enough room for 13 files. Sholeh cannot delete any files.
How many files will not fit?

7. A ribbon is 45 cm long. Adam cuts off a piece.
The ribbon that is left is 12 cm long.
How long was the piece Adam cut off?

8. For each equation, write a story problem that could be solved by using the equation.

a) $30 = a + 5$ **b)** $b - 4 = 25$ **c)** $40 - c = 16$ **d)** $35 = d - 11$

9. a) Write as many different equations as you can for this problem:
Sandra and Kirk have 72 linking cubes.
Kirk has 28 cubes.
How many cubes does Sandra have?

b) Solve each equation you wrote in part a.

c) Solve the problem in part a.

Show your work.

Reflect

Which method for solving an equation do you find easiest?
Explain your choice.

For some online practice, visit your Netmath site, www.netmath.ca

There will be some activities waiting there for you to try:

a. Identifying equivalent expressions
b. Solving addition and subtraction problems
c. Solving simple equations using pan balances (this one is interactive)
d. Solving an equation with one unknown

I won't assign any specific games this week, but as always, do encourage you to continue practicing your facts. If you like, you can use some of the games offered last week to practice at www.timestables.com and the Far Out Functions game on www.mathplayground.com for solving algebraically, now that you have a little more knowledge of algebraic solutions. 😊

Have a fantastic week Grade 5!